REMARKS

The issues outstanding in this case are as follows:

- Claims 12-18 have been rejected under 35 U.S.C. §112, second paragraph;
- Claims 1-7, 9-14, 19-20, and 24 have been rejected under 35 U.S.C. §102(e) as anticipated by Yamauchi, and
- Claims 15-18 and 21-22 have been rejected under 35 U.S.C. §103 as obvious over Yamauchi in view of Uematsu.

Applicant respectfully requests reconsideration and withdrawal of these rejections in view of the amendment herein and the remarks that follow.

35 U.S.C. §112

Claims 12-18 have been rejected under 35 U.S.C. §112, second paragraph, for depending from a cancelled claim. Claims 12, 15 and 18 have been amended herein to depend from claim 1. Accordingly, Applicant requests withdrawal of this rejection.

35 U.S.C. §102

Claims 1-7, 9-14, 19-20 and 24 have been rejected under 35 U.S.C. §102(e) as anticipated by Yamauchi. Claim 1 has been amended to incorporate the limitations of claims 2 and 24, and claims 2 and 24 have been cancelled.

Claim 1, as amended herein, requires that extraction of nucleic acids occur by the binding of the nucleic acids to the silica particulate carrier via hydrogen bonds between 1) hydroxyl groups on the surface of the carrier and 2) bases of the nucleic acids. In other words, the claims require the formation of hydrogen bonds between hydroxyl groups on the surface of the particulate carrier and bases of the nucleic acids. By contrast, Yamauchi teaches that a non-limiting amount of an acrylamide coupling agent is applied to, and saturates, the entire surface of the silica particle. Yamacuchi, column 8, lines 52-55; column 11, lines 29-38. Therefore, Yamauchi does not disclose hydrogen bonding between the nucleic acids and the silica particle, because all available binding sites on the silica particle are occupied by the coupling agent.

Indeed, Yamauchi discloses that the polar functional groups of the polyacrylamide coupling agent that interact with the nucleic acids are not only fixed to the surface of the particle, but extend away from the surface of the carrier at the end of long molecular polyacrylamide chains, the other ends of which are bonded to the particle surface. Yamauchi, column 11, line 64-column 12, line 5. In this way, according to Yamauchi, the number of active sites for interacting with the nucleic acid is increased, and "the interaction formed is firmly held by superposition with the polyacrylamide."

Thus, in contrast to the present invention, Yamauchi teaches the binding of nucleic acids with the polyacrylamide that covers the surface of silica particle. Yamauchi, in fact, teaches away from bonding between nucleic acids and the OH groups (silanol groups) on the surface of silica particles because Yamauchi teaches, at column 11, lines 29-38, that the surface is already saturated, leaving no OH groups available to bind nucleic acids.

In short, claim 1 requires that the OH groups on the surface of the silica particles and the nucleic acids be bound by hydrogen bonds. This method is completely different from the method of Yamauchi. Therefore, amended claim 1 and claims 3-7, 10-13 and 15-22, which depend from claim 1, are patentable over Yamauchi.

35 U.S.C. §103

Claims 15-18 and 21-22 have been rejected under 35 U.S.C. §103 as obvious over Yamauchi in view of Uematsu.

Acknowledging that Yamauchi does not disclose the additional limitations recited in these claims, the Office Action cites Uematsu for the proposition that it was known to use a first wash buffer containing guanidine thiocyanate and a second wash buffer containing 70% ethanol, and that it was also known to use PCR and NASBA for amplification purposes, and to use nucleic acid hybridization for detection purposes.

Claims 15-18, 21 and 22 all ultimately depend from claim 1 and contain all of the elements and limitations of claim 1. The cited teachings of Uematsu do not cure the

deficiencies of Yamauchi with respect to claim 1 and therefore cannot render obvious any of the claims that depend therefrom, including claims 15-18, 21 and 22. Therefore, withdrawal of the rejection of these claims is respectfully requested.

In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing 472552000100.

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Respectfully submitted,

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VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

Claim 1 has been amended to read as follows:

1. (Amended) A method of extracting nucleic acids from a material containing nucleic acids using a nucleic acid-binding particulate carrier which contains silica or its derivative. The method comprising the steps of:

(a) mixing the material containing nucleic acids, a nucleic acid-binding particulate carrier having a particle diameter of 0.5 to 15.0 μm, a pore diameter of 80 to 250 nm and a pore volume of 0.2 to 5 ml/g, and a nucleic acid extraction solution for allowing the nucleic acids to adsorb to the particulate carrier, to thereby bind the nucleic acids to the particulate carrier, the nucleic acids being bound to the silica particulate carrier via hydrogen bonds formed between hydroxyl groups on the particle surfaces of the carrier and bases of the nucleic acids;

(b) separating a composite of the nucleic acids and the particulate carrier from the mixture obtained in Step (a) to remove contaminants: and

(c) eluting and collecting the nucleic acids from the composite of the nucleic acids and the particulate carrier.

3. (Amended) A method according to Claim ~~2~~ 1 wherein the particulate carrier containing silica or its derivative is a magnetic particulate carrier.

12. (Amended) A method according to Claim ~~8~~ 1 wherein the nucleic acid extraction solution contains a chaotropic substance.

15. (Amended) A method according to Claim ~~8~~ 1 wherein the composite of the nucleic acid and the particulate carrier obtained in Step (b) is washed with a first washing solution containing a chaotropic substance and a second washing solution containing alcohol.

18. (Amended) A method according to Claim ~~8~~ 1 wherein the composite of the nucleic acid and the particulate carrier obtained in Step (b) is washed with a washing solution containing ethanol at a concentration of 70% and a washing solution containing ethanol at a concentration of 99%.